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The AGARA RIVER with its Canadian Environs



From Lake Erie
to Lake Ontario.
An authentic
collection of
information
concerning an
historic region

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Ontario, Queen Victoria Niagara Falls Park
Commission

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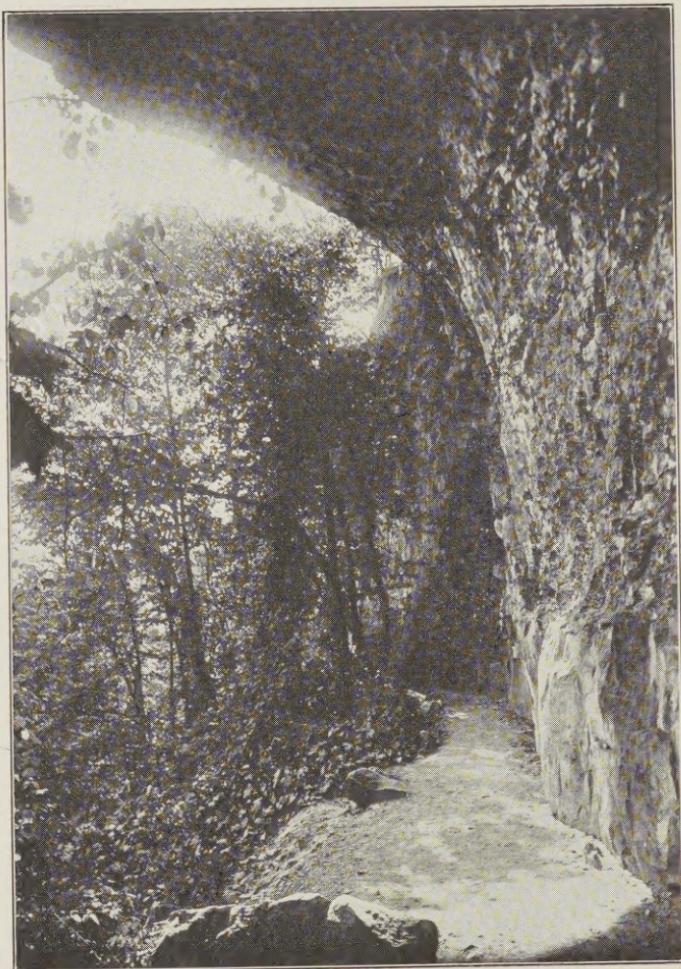
The NIAGARA RIVER with its Canadian Environs



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In the Niagara Glen. Wild and picturesque scenery

The Niagara River with its Canadian Environs

The river "makes such a noise at its falling down in one place as is heard all over the world."—*Thoreau*.

THE Niagara cataract, the gorge, the whole river from lake to lake, together with the adjoining country are replete with interest for the tourist, the historian, the geologist, the botanist, the engineer and the industrialist. To the majesty of Nature's masterpiece man has added the most remarkable hydro-electric development to be found in any quarter of the globe. The rapids and falls have been harnessed without marring the original beauty of the scene.

To the late Lord Dufferin, Governor-General of Canada is attributed the first public utterance leading up to the rescue of the river and cataract from the unscrupulous concessionaires who formerly occupied both shores and ruthlessly exploited visitors. It was in 1878 that His Excellency made his appeal. An act passed by the Legislature in 1885 created the Queen Victoria Niagara Falls Park Commission with wide powers over the Canadian bank of the river. The Government of New York State took similar action on the American side. The squatters and fakirs on both shores were bought out so that the whole world might have free access to the water fall.

In this connection it is interesting to recall that in 1764 the Seneca Indians deeded to Sir William Johnson, and through him to the British Crown, a strip of land two miles wide on either side of the Niagara River from Lake Erie to Lake Ontario, together with all the Islands in the river. Much of this property on the Canadian side was Crown granted to the United Empire Loyalists. The American State authorities sold out most of their two mile strip to private purchasers. When both countries started to give the public free access to the beauties of Niagara, they had to buy out the vested interests thus created. The construction of the park and boulevard system on both shores would have been greatly facilitated had the State retained the land originally secured for the Crown by Sir William Johnson.

THE PARK AREA—The Park area of 154 acres originally placed under control of the Canadian Commission has grown by successive grants until it comprises 1,178 acres of land and water surface stretching along the 35 miles of river between Lake Erie and Lake Ontario. The objective is a series of parks connected by a modern well paved boulevard system stretching from Fort Erie to Niagara-on-the-Lake. The old battle grounds of Fort Erie, Lundy's Lane (Drummondville Cemetery) and Queenston Heights, and the historic burial ground of the Butler family near Niagara-on-the-Lake, are being preserved. The Boulevard is complete for the 20 miles separating the village of Fort Erie from the city of Niagara Falls, and the near future will see the system extended by way of the Whirlpool, the Niagara Glen, Queenston Heights and the lower river drive to Fort George and Fort Mississauga at Niagara-on-the-Lake. The Commission derives its revenue in the main from the rentals paid by the hydro-electric enterprises which develop their power within the Park.

THE COMMISSION—Sir Casimir Gzowski was the first Chairman of the Commission. He was succeeded in 1893 by Mr. J. W. Langmuir, and he in 1915 by Mr. P. W. Ellis, the present Chairman. To all three and to their fellow commissioners must be conceded a great measure of the success that has been achieved in preserving and beautifying the area under their jurisdiction. The present members of the Board besides Mr. Ellis, are:—

His Honor, Lionel H. Clarke, Lieut.-Gov. of Ontario.
Mr. George H. Wilkes, Brantford.
Lieut.-Col. L. Clarke Raymond, K.C., Welland.
Mr. James D. Chaplin, St. Catharines.
Mr. W. L. Doran, Niagara Falls.
Dr. Harry Y. Grant, Niagara Falls.

The Commissioners are ably supported in their public spirited undertaking by the capable Park Superintendent, Mr. John H. Jackson and a small body of hard-working officials and police.

FORT ERIE—The most southerly tract under the control of the Canadian Commission is the Park of 17 acres abutting partly on Lake Erie—partly on the Niagara River and embracing the historic ruins of old Fort Erie. Something remains of the old stone fortress and its mud out-works. A monument to the officers and men who fell here in the war of 1812-1814 overlooks the broad river and the city of Buffalo beyond. The inscription upon the

column reads: "Dulce Est Decorum Pro Patria Mori." The tradition of self-sacrificial patriotism then established was potent in sending nearly half a million Canadians to fight the battles of Empire and civilization in the great world war recently concluded.

. . . The gap of two miles between Fort Erie and the beginning of the boulevard pavement at the village of Fort Erie is shortly to be bridged. This improvement will admit travellers to a scene which all true Canadians and all true British people should hold sacred. According to local rumor much of the stone that has disappeared from the Fort walls was employed in erecting a near-by church.

A few miles inland was fought the battle of Ridgeway, an incident in the Fenian invasion of 1866. Canadian volunteers speedily expelled the enemies of their country.

NAVY ISLAND—Leaving the village of Fort Erie, the boulevard enters the neighboring town of Bridgeburg with its International Railway Bridge leading to Black Rock on the opposite shore. Below Bridgeburg the boulevard parallels the winding bank of the majestic river, which in this part is fully a mile wide. For over six miles Grand Island, an American possession, splits the river into two streams, and immediately below it lies Navy Island, famous in history as the spot where a few adventurers rallied to the support of William Lyon MacKenzie in the Rebellion of 1837. He went so far as to proclaim a Republic of Canada on this tiny Isle and to fly a flag containing one star and two stripes as the emblem of his "Government." The United States Steamer "Caroline" brought down from Buffalo to assist the rebels was caught on the American side by an attacking party of Canadians from Chippawa. The vessel was set afire and drifted blazing to destruction in the cataract.

CHIPPAWA—The next point of interest on the Boulevard is the village of Chippawa, which used to be the Canadian terminus of an important ferry service in the days before bridges and railways spanned the Niagara. As this was the first point above Queenston where the river could be crossed, it formed the southerly end of the long Queenston-Chippawa portage by which the gorge, the cataract and the upper rapids were circumvented. This old portage road is still in use. The Chippawa end was defended by a small fort and by shore batteries. The battle of Chippawa was an important engagement in the struggle of 1812-14. At this point an unusual engineering feat is about to be performed. The Welland River or Chippawa

Creek, which has heretofore flowed into the Niagara River, is to be turned around and made to flow for four and a half miles into the new Hydro-Electric power canal now under construction between Chippawa and Queenston.

DUFFERIN ISLANDS—A mile or so down stream the Boulevard skirts the Dufferin Islands named in honor of the former Governor General of Canada. At this point the diverted waters of the great river flow in several channels. Tiny rapids and cataracts feebly imitate the mighty torrent near at hand. Rustic bridges connect the islands. Rustic benches, set in shady nooks, offer a quiet resting place for those in search of peaceful scenes.

POWER PLANTS—Adjoining the Dufferin Islands and farther down the river are the head works, architecturally handsome, of the privately owned and public owned hydro electric enterprises which light the streets of cities 200 miles distant, operate traction systems in scores of municipalities, and drive the industrial plants of half a Province and part of a State. These power plants draw their water from the roaring rapids which stretch for over a mile above the Falls.

THE CATARACT

TABLE ROCK—At Table Rock the visitor experiences the peak load of Niagara sensations. He is blinded by the towering spray, stunned by the crashing waters, over awed in the presence of Nature's majestic might. From Table Rock House a scenic tunnel leads behind the Horseshoe Falls. From the vantage point thus gained one gazes upward, spellbound, at a vast, arched wall of thundering water pouring incessantly over the precipice far above.

THE REFECTIONY—A few rods down stream from Table Rock stands the REFECTIONY, a public owned restaurant conducted under Government auspices where the people may purchase food and refreshing drinks at popular prices. The balconies where the tables are spread command an inspiring view of the Canadian and American Falls. Below the balconies is located a cafeteria where hasty meals may be procured at little cost.

QUEEN VICTORIA PARK—Queen Victoria Park through which we now proceed down stream is one of the most beautiful



In the Niagara Glen. One of the tortuous footpaths

in the world. Its velvety greensward, its rose garden and flower beds, its trees of native and foreign origin, are everlastingly refreshed by the spray from the Cataract. This peaceful park presents a strange contrast to the raging waters in the gorge 180 feet below of which entrancing views are obtained from the handsome observation stations at Inspiration Point and Ramblers' Rest. The Heacock tablet commemorates the heroic death of a young American in the ice bridge tragedy of 1912. The handsome northern entrance to the park is called the Mowat Gate in honor of the Provincial Premier under whose Government the bank of the Niagara was rescued from grasping exploiters and preserved for the people.

THE NIAGARA GLEN

WEIRD SCENERY—A five mile ride on the electric railway carries one past The Maid of the Mist landing, the Whirlpool Rapids, and the Spanish Aerial Tramway over the Whirlpool, to another Government owned attraction—THE NIAGARA GLEN. This secluded spot, formerly called Foster's Flats, seems to be known to comparatively few people, but in natural beauty and scenic grandeur it ranks next to the Cataract itself. Hemmed in between beetling cliffs and the raging river, it is reached by means of a long precipitous downward climb. Once at the bottom, one realizes what the bed of the Niagara River must look like, for the Glen was once a portion of that bed from which the waters long ago subsided. The handiwork of the potent stream is apparent on all sides. Ponderous overhanging crags, ice cold grottos and capacious "pot holes," proclaim the ages during which the mighty Niagara held full sway here. The enormous rocks scattered about the floor of this retired resting place might have been tossed there and forgotten by careless giants in their play. They are in reality the ruins of an ancient Table Rock that overhung the cataract when it was located at this point.

From the foot of the cliff, seductive foot paths thread their tortuous ways amidst the tall trees and abundant shrubbery, past surprising caverns, through natural arbors, under archways of stone to rustic seats beneath rocky ledges, and finally to the river bank where once again the scenery arrests the eye and charms the appreciative mind. In this sheltered spot, the vegetation may be classed as almost sub-tropical. Orchids and other plants, seldom found in this high latitude, thrive in these leafy dells. The

Glen is a favorite resort for botanists from many parts of the world, as it is for geologists who come here to read the history of Niagara chronicled in the rocks.



H.R.H., the Prince of Wales, at the Niagara Glen in October, 1919. He was attended by Mr. P. W. Ellis, Chairman of the Park Commission.

GREAT POWER DEVELOPMENT—A mile further down stream we pass the collecting basin or forebay of the new public owned Hydro-Electric power canal which is to develop 475,000 horsepower for the people of Ontario. Here are to be located the penstocks and turbines with a head of over 300 feet. Further particulars of this vast enterprise are found elsewhere.

QUEENSTON HEIGHTS

BROCK'S MONUMENT—A mile down the river the trolley car sets us down at Queenston Heights. This is one of the most sacred spots in Canadian history. In the war of 1812-1814, American troops crossed the river from Lewiston, landed on Canadian soil and took possession of the Heights. Early the same morning—that of October 13th, 1812—the British Governor, Sir Isaac Brock, left Fort George, Niagara-on-the-lake, and hastened to the scene on horse back. Riding up the river road, he set his little army in battle array and stormed the Heights. The engagement cost him his life and a grateful country erected a splendid monument in his memory. That first monument was blown up by an American vandal in 1840 and was replaced by the superb column which now dominates the landscape. The spot—part way up the hill—where he died victorious is marked by a cenotaph and flagstaff.

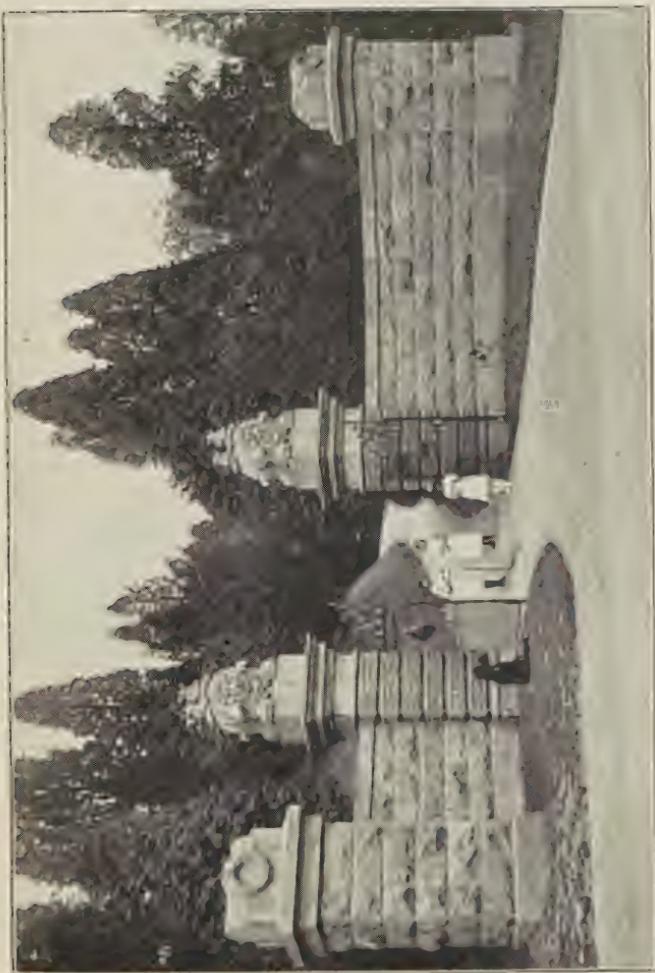
LAURA SECORD—Near at hand on the site of the first Brock's monument is a modest stone memorial of Laura Secord, the young heroine of the war, who at night walked many miles through the primeval forest to warn the British of an impending attack, thus saving the day at the battle of Beaver Dams on June 24th, 1813.

A SUPERB PANORAMA—The Government park which occupies the Heights is one of the most beautiful spots in Ontario. It commands a view of the lower river and the Niagara plain that is scarcely surpassed in any part of the world. The panorama of river, and orchard and vineyard and tilled fields which spreads away to the shores of Lake Ontario is one that has delighted visitors from every clime.

As the observer, stationed on this ancient battle field, surveys the sunlit expanse of peaceful prosperity spread out at his feet, a scene from Genesis is naturally recalled. It is that in which Abraham invited Lot to make a choice of the land on the right hand or the left. "Lot lifted up his eyes and beheld all the plain of Jordan that it was . . . even as the garden of the Lord." To see the Niagara country when it is aflame with peach blossoms and white with apple blossoms is to have a foretaste of paradise.

A SAIL DOWN THE RIVER

After escaping from the narrow gorge at Queenston, the Niagara River expands into a broad smoothly flowing stream.



Entrance Gates, Queenston Heights Park

The speed of the current all the way to Lake Ontario, seven miles distant, is about four miles an hour. The visitor may drive down either shore to the mouth of the river, or he may take one of the great Canadian passenger steamers which leave Queenston and Lewiston every other hour during the summer months, and call at Niagara-on-the-lake before crossing Lake Ontario to Toronto.

OLD FORT—The stone fort at the mouth of the river on the American Side is Fort Niagara. The original fortress at this point was planned by La Salle, the French explorer and discoverer of the Mississippi in 1669. At successive stages it has been occupied by French, British and American troops. Fort George and Fort Mississauga guarded the Canadian side of the river. It was from Fort George that Sir Isaac Brock hastened the morning that he fell at Queenston Heights.

AN ANCIENT CAPITAL—The beautiful old town of Niagara-on-the-lake (once Newark) with its broad streets and extensive commons, was the first capital of Upper Canada, now Ontario. Here in 1792 the first Provincial Legislature at its first session, passed a law making slavery illegal throughout Upper Canada. This Province thus became a popular resort for escaped American blacks who continued to regard this country as a "city of refuge" until the American Civil War and the freeing of the Southern negroes two generations later.

EARLY HISTORY

Judging by the records of his second voyage up the St. Lawrence in 1535 Jacques Cartier heard of Niagara Falls from the Indians. References to the Cataract though not by name appear from 1604 onwards in Champlain and the Jesuit Relations.

It is probable that the Falls were first seen by white men in the early part of the seventeenth century. It is even possible that Champlain's interpreter, Etienne Brûlé, visited the scene. Father de la Roche Dallion seems to have reached the river in 1626 as did the Jesuit Fathers Brebeuf and Chaumonot, in 1640. In 1648 the Jesuit Father, Ragueneau, in a letter to the Superior of the Mission at Paris wrote, "North of the Eries is a great lake about 200 leagues in circumference, called Erie, formed by the discharge of the mer-douce or Lake Huron, and which falls into a third lake, called Ontario, over a cataract of frightful height."

Thirty years later in the winter of 1678-9, Father Hennepin visited the Cataract and wrote an exciting account of it, accompanied by an interesting sketch. In part he said, "Betwixt the lakes Ontario and Erie there is a vast and prodigious cadence of water which falls down after a surprising and astonishing manner, insomuch that the universe does not afford its parallel. It (the river) is so rapid above the descent, that it violently hurries down the wild beasts while endeavoring to pass it, they not being able to withstand the force of its current, which inevitably casts them headlong above six hundred feet high. This wonderful downfall is composed of two great cross streams of water and two falls, with an isle sloping along the middle of it. The waters which fall from this horrible precipice do foam and boil after the most hideous manner imaginable, making an outrageous noise, more terrible than that of thunder; for when the wind blows out of the south their dismal roaring may be heard more than fifteen leagues off."

In the autumn of 1687 Baron La Hontan wrote, "The waterfall of Niagara is seven or eight hundred feet high and half a league wide. Towards the middle of it we descry an island, that leans towards the precipice, as if it were ready to fall."

In 1721 M. Charlevoix, sent to Madame Maintenon, the mistress of Louis XIV, an estimate of the falls in which he referred to the inaccurate accounts of Hennepin and La Hontan. In this letter he placed the height of the Falls at one hundred and forty or one hundred and fifty feet.

In 1751 Rev. Abbe Picquet wrote, "This Cascade is as prodigious by its height and the quantity of water which falls there, as by the variety of its falls, which are to the number of six principal ones divided by a small island, leaving three to the north and three to the south. They produce of themselves a singular symmetry and wonderful effect."

NOMENCLATURE

The name "Niagara" comes from the Iroquois language which derived it from the Neutral Indians who inhabited the Niagara region and were an aboriginal buffer state between the warlike Iroquois on the one hand and the fierce Hurons on the other. These Neutrals were sometimes called the Onguaahra (Niagara) Indians. This name first appeared in print in a letter written by Father Lalement and included in the Jesuit Relations. In the early days the word was spelled in thirty-nine or forty different ways. Sanson's map of Canada published in Paris in

1657 gave the spelling Ongiara. Another map published in Paris in 1688 gave the present spelling—Niagara. There is ample reason for believing that the Indian pronunciation accented the third syllable. The accent of the second syllable has been long in use. Niagara has been variously translated, two alleged meanings being "The Neck" and "Thundering Waters."

Queenston was named after Queen Charlotte, wife of King George the First.

Lewiston was so named in 1805 in honor of Governor Lewis of New York.

Goat Island got its name from a herd of goats established on that remote piece of land by Mr. John Stedman in the summer of 1779. Goat Island has also been called Iris Island, The Temple of Nature, The Sacred Isle, The Fairy Isle, The Enchanted Isle, The Isle of Beauty, The Shrine of the Deity and "the most interesting spot in all America."

DISTANCES AND DIMENSIONS

The Niagara River is thirty-five miles long from Lake Ontario to Lake Erie with a drop of 326 feet. In the 20 miles between Lake Erie and the head of the first rapids the drop is 10 feet. These upper rapids are a mile long with a fall of 55 feet to the edge of the Cataract. The Horseshoe Falls are 162 feet high. From the base of the falls to the Whirlpool, $3\frac{1}{2}$ miles, the drop is 55 feet, and from the Whirlpool to Queenston, another $3\frac{1}{2}$ miles, 44 feet.

It is estimated that the water is 30 feet deep where it flows over the center of the Horseshoe falls and that over 20,000,000 tons of water pass over the Cataract every hour. Ninety-five per cent. of the water flows over the Canadian fall and five per cent. over the American.

The Canadian Fall is about 3,000 feet in width and the American Fall about 1,100 feet wide. As Goat Island is about 1,200 feet wide, the distance from the Canadian mainland to the American mainland at this point is 5,300 feet.

The deepest channel in the river above the Upper Rapids has about 30 feet of water. From the falls to the Cantilever bridge, nearly two miles down stream, the depth of the river is about 200 feet. The depth of the Whirlpool rapids is said to be only 40 feet while the Whirlpool is 200 feet deep. From the Whirlpool to Lewiston the depth is estimated at 60 feet.

The River is less than half a mile wide at Fort Erie, over a mile wide just above the Falls, an eighth of a mile wide in the



Brock's Monument, Queenston Heights Park

Whirlpool Rapids, and about one sixteenth of a mile wide at the Niagara Glen where the roaring torrent is confined within its narrowest limits.

The Niagara River is fed by Lake Erie, 80 feet deep, by Lakes Michigan, Huron and Superior, each 1,000 feet deep, by a hundred smaller lakes and by many rivers and smaller streams tributary to these great bodies of water.

CHANGES IN THE CATARACT

Alterations in the configuration of the Falls have undoubtedly occurred since they were first viewed by white men. According to the sketch by Father Hennepin, who visited the Cataract in the winter of 1678-9, there were three falls, one on either side of what is now called Goat Island, and a third flowing at right angles and across the face of what is now known as the Canadian Falls. At that time the Canadian Cataract was almost as far down stream as the American Fall. If Hennepin's chart is anything like accurate the Canadian Fall has receded many hundreds of feet in the last 231 years. It is in fact claimed by close observers, that the Horseshoe Cataract goes back at the rate of about five feet a year, while the American Fall stands comparatively still, having retired only a few inches in generations. The reason for the rapid recession of the Canadian Fall is of course the immense volume of water which continually pours over it, undermining the comparatively soft shale which underlies some 80 feet of hard limestone in this part of the country. The Horseshoe Fall is thus continually digging its own grave, only to enjoy an everlasting resurrection.

The Table Rock is itself a striking example of the erosion which continually goes on. According to an early writer it was once a smooth platform "about fifteen rods long and five rods wide" hanging over the abyss in front of the Horseshoe Fall. Professor Kalm in his book of travel, recorded the collapse of a portion of this great platform previous to 1750. In 1818 a mass of rock 160 feet long and 30 feet wide fell into the abyss below. In 1828-29 two similar portions of rock detached themselves simultaneously with about half an acre of rock at the center of the Horseshoe. On June 25th, 1850, says Mr. Peter A. Porter, occurred a great downfall which reduced Table Rock to its present narrow dimensions. The portion which fell on that occasion measured 200 feet in length and 60 feet in width, and the noise of its fall was heard for miles around.



First known picture of Niagara, 1697, showing the third Cross-Fall, spoken of by Hennepin.

Goat Island has suffered from similar losses of area. It used to overhang the river as if about to tumble in. In the spring of 1852 a great portion of the South corner of the Island fell with a grinding crash. A strip of land 10 rods wide by 80 rods long has been worn away from the Southern Shore since 1818. If the early records can be trusted, Goat Island used to be 250 acres in extent, whereas now it contains less than 70 acres.

AGE AND GEOLOGY OF THE FALLS

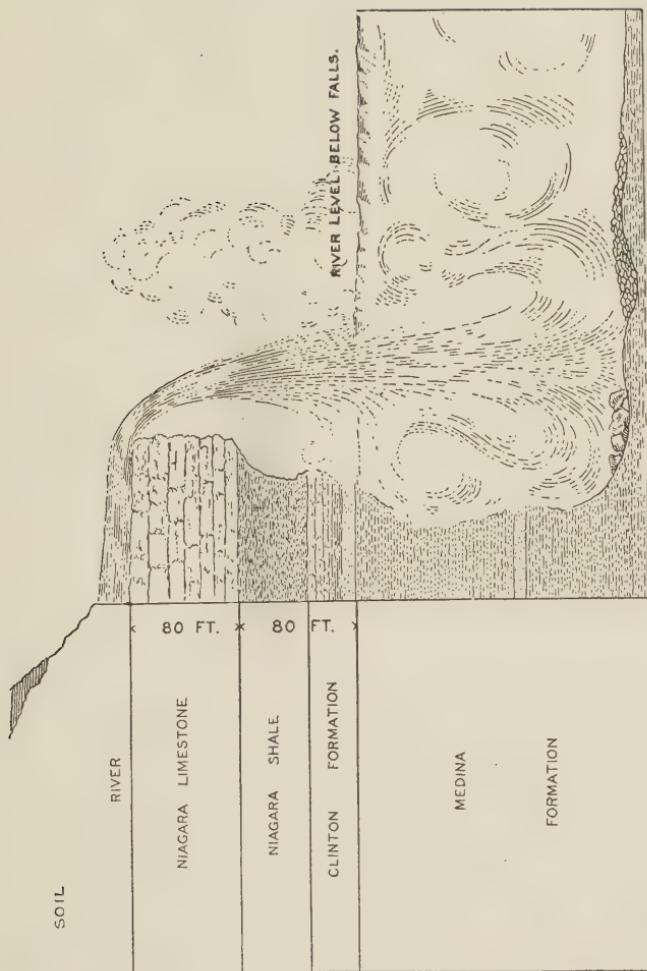
Scientists estimate the age of the falls at from 30,000 to 35,000 years. The Cataract is believed to have been first located at Queenston and to have worn its way gradually back to its present position. The original fall is said to have been fed only by Lake Erie. The theory is, that prior to that time, the great upper Lakes emptied either through the Mississippi Valley or the Ottawa Valley. A gradual tilting of the earth's crust is understood to have thrown the balance in favor of the St. Lawrence route, and hence the dimensions of the Niagara of to-day. There are those who declare that the movement of the earth Niagara-wards, is now being reversed, and that at some remote period, tens of thousands of years hence, Lake Huron, Lake Superior and Lake Michigan will again flow down the Mississippi, thus robbing Niagara of its glory and power. The limestone formation over which the cataract pours is declared to be older than the Alps, the Pyrenees or the Himalayas.

WHEN THE FALLS DRIED UP

Owing to an ice dam at the foot of Lake Erie on March 29th, 1848, the American Falls went dry and the Horseshoe Fall was reduced to a rivulet. From a somewhat similar cause the American Falls disappeared for a few days in the winter of 1909. In April, 1909 a great ice jam in the Lower Niagara lifted the water 33 feet above the normal at Queenston, practically obliterated the Whirlpool and the Whirlpool Rapids, and submerged the Ontario Power Company's power plant at the foot of the Cataract. There were similar jams in 1856 and 1866.

THE ABODE OF THE DEITY

According to tradition the Indians regarded the Cataract as the Deity or at least the abode of the Deity. They made periodical sacrifices to the Great Spirit by casting portions of their



Prof. Shaler's sectional view of Niagara, showing how the Cataract excavates the soft shale underlying the hard limestone formation, over which the Horseshoe Fall pours.

property into the Falls. It is said that once a year they placed a beautiful maiden in a canoe and sent her over the precipice unattended. As late as 1851 some Indians from a distant point in the United States were observed as they solemnly cast their pipes into the raging waters.

TARRY AT THE FALLS

The full grandeur of the Cataract does not dawn on most people at first sight. The Falls need to be wooed to be understood. If the visitor would get the best out of it, he will not hurry his inspection. He will study the spectacle at all hours and under varying weather conditions. He will view it in early morning, at noon, and under the setting sun. He will watch the wonderful rainbow effects which are to be seen in the rising mists on a sunny day. He will see the complete circular rainbow which is to be observed from behind the Falls. He will even see the lunar rainbow found under certain bright atmospheric conditions when the moon is at its full. He will commune with the mighty Cataract until his mind and soul grasp its full grandeur, its utmost majesty. In particular, he will visit it in winter when the frost has worked a wondrous change in the scene.

DISTINGUISHED VISITORS

It would be impossible to compile a complete list of the distinguished personages who have visited Niagara Falls. It may however be stated that Queen Victoria's father, the Duke of Kent, spent two weeks here in 1791; that King Edward VII came to the falls while Prince of Wales in 1859; that King George and Queen Mary spent sometime in this locality as the Duke and Duchess of York. The latest member of the British Royal family to enjoy Niagara was the present heir to the throne, Edward, Prince of Wales, "Prince Charming" as the people call him, who was the Guest of the Canadian Park Commissioners for a few days in 1919.

BRIDGES ACROSS THE NIAGARA

The nearest bridge to the Falls was formerly of the graceful suspension type. It was built in 1869, the heavy steel cables being carried across the gorge on an ice bridge. This structure was destroyed by a heavy gale in 1889. It was at once repaired. It was replaced by the present steel arch structure in 1895.

At the head of the Whirlpool Rapids, a mile or more down stream, are two railroad bridges. The lower of these occupies the site of the first bridge thrown across the Niagara Gorge—a suspension bridge erected in 1848. The first cable was carried across the canyon by means of a kite flown by a small boy. A heavy cord was attached to the kite string, a rope to the cord, a steel cable to the rope, and so the chasm was bridged. The suspension structure at this point was remodelled in steel in 1880 and re-built as an arch bridge in 1897. The Cantilever railroad bridge a few rods up stream was erected in 1892.

The new suspension bridge which crosses the lower end of the gorge just above Queenston and Lewiston is the only suspension bridge remaining on the Niagara. It was built in 1850 and destroyed by a heavy gale in 1866. The cables hung unused until the present structure was erected in 1899.

MAIDS OF THE MIST

The River has seen several Maids of the Mist. The first appeared in 1846, being constructed like her successors beside the eddy below the Falls. The second Maid of the Mist was built in 1854. This vessel became unprofitable and was sold for delivery at Niagara-on-the-lake. Mr. Joel R. Robinson, the Captain, offered to take her through the Whirlpool and the Whirlpool Rapids. He was accompanied by a Wheelman and an Engineer. The momentous voyage was essayed on June 15th, 1867, and was successfully carried out.

SENSATIONAL INCIDENTS

In 1883 Captain Webb, an Englishman, attempted to swim the Whirlpool rapids and the Whirlpool. The effort resulted in his death. His body was taken from the river with a deep gash on the forehead, probably caused by collision with a sharp rock in the rapids.

In recent years a man and a woman have gone over the Falls in padded barrels, built for the express purpose. Both survived the ordeal.

In 1859 Blondin, the daring Frenchman, repeatedly walked a tight rope strung across the gorge between Niagara Falls, Ontario, and Niagara Falls, New York.

In 1826 William Morgan of Batavia, New York, threatened to expose in print the secrets of the Masonic order. He was shortly

afterwards seized and confined in Fort Niagara. He was never heard of again. The supposition is that he was put to death by drowning in the lake nearby.

THE FALLS IN LITERATURE

A great many literary people have visited the Falls, but none of them seems to have written anything worthy of so tremendous a subject. Poets and prose writers have both failed to give an adequate word picture of the scene. Some of them frankly confess their inability to do so:—

“I saw Niagara,
Oh God! who can describe that sight.”

—*Fanny Kemble.*

“I came to see—
I thought to write—
I am but dumb.”—*Anon.*

“I dare not write my name
Where God has set his seal.”—*Anon.*

“Here speaks the voice of God—let man be dumb,
Nor with his vain aspiring hither come.”

—*Willis G. Clark.*

“The thoughts are strange that crowd into my brain
While I look upward to thee. It would seem
As if God pour'd thee from his hollow hand
And hung his bow upon thine awful front,
And spoke in that loud voice which seem'd to him
Who dwelt in Patmos for his Saviour's sake,
The sound of many waters, and had bade
Thy flood to chronicle the ages back
And notch his centuries in the eternal rocks.”

—*John G. C. Brainard.*

“This is Jehovah's fullest organ strain!
I hear the liquid music, rolling, breaking;
From the gigantic pipes the great refrain
Bursts on my ravished ear, high thoughts awaking!

The low sub-bass, uprising from the deep,
Swells the great paean as it rolls supernal,
Anon, I hear, at one majestic sweep,
The diapason of the keys eternal.

Standing beneath Niagara's angry flood—
The thundering cataract above me bounding—
I hear the echo: 'Man, there is a God!'
From the great arches of the gorge resounding.”

—*B. Frank Palmer.*

Henry James wrote:—

"The great Fall faces you, enshrined in the surging incense of its own resounding mists. Already you see the world-famous green, baffling painter, baffling poets, clear and lucid on the lip of the precipice, the more so, of course, for the clouds of silver and snow into which it drops. A green more gorgeously cool and pure it is impossible to conceive. You can fancy it is the parent green; the head spring of color to all the verdant water caves, and all the clear haunts and bowers of naiads and mermen in all the streams of earth. The river drifts along, with measured pride, deep and lucid, yet of immense body—the most stately of torrents. Its movement, its sweep, its progression are as admirable as its color, but as little as its color to be made a matter of words. These things are but part of a spectacle in which nothing is imperfect. You stand steeped in long looks at the most beautiful object in the world."

James Fenimore Cooper wrote:—

"We were less struck with the grandeur of this cataract than with its sublime softness and gentleness. We felt ourselves attracted by the surpassing loveliness of Niagara. The gulf below was more imposing than we had expected to see it, but it was Italian in hue and softness, amid its wildness and grandeur. Not a drop of the water that fell down the precipice inspired terror; for everything appeared to us to be filled with attraction and love."

Capt. Marryat wrote:—

"As I stood on the brink of the Fall, I could not help wishing that I could have been so made that I might have joined it in its flow, with it to have rushed harmlessly down the precipice, to have rolled uninjured into the deep unfathomable gulf below, and to have risen again with the spray to the skies."

Trollope wrote:—

"Of all the sights on this earth of ours which tourists travel to see—at least of all those which I have seen—I am inclined to give the palm to the Falls of Niagara. In the catalogue of such sights I intend to include all buildings, pictures, statues and wonders of art made by men's hands, and also all beauties of nature prepared by the Creator for the delight of His creatures. This is a long word; but as far as my taste and judgment go it is justified. I know no other one thing so beautiful, so glorious, so powerful."

In 1804 Tom Moore wrote:—

"I have seen the Falls, and am all rapture and amazement . . . but saw through the trees this mighty flow of waters descending with calm magnificence and received enough of its grandeur to set imagination on the wing—imagination, which even at Niagara, can outrun reality. . I felt as if approaching the residence of the Deity; the tears started to my eyes; and I remained, for moments after we had lost sight of the scene, in that delicious absorption which enthusiasm alone can produce. We arrived at the New Ladder and descended to the bottom. Here all its awful sublimities rushed full upon me; but the former exquisite sensation was gone, I now saw all. The string that

had been touched by the first impulse and which fancy would have kept forever vibrating, now rested in reality. Yet, though there was no more to imagine, there was much to feel. My whole heart and soul ascended towards the Divinity in a swell of devout admiration, which I never before experienced. Oh, bring the atheist here and he cannot remain an atheist. I pity the man who can coldly sit down to write a description of these ineffable wonders; much more do I pity him who can submit them to a measurement of gallons and yards. It is impossible by pen or pencil to give even a faint idea of their magnificence. Painting is lifeless, and the most burning words of poetry have all been lavished upon inferior and ordinary subjects. We must have new combinations of language to describe the Falls of Niagara."

In 1842 Charles Dickens wrote:—

"Within a few minutes of our stopping, not before, I saw two great white clouds rising up slowly and majestically from the depths of the earth, that was all. At length we alighted, the ground trembled underneath my feet . . . When we were seated in the little ferry boat and were crossing the swollen river, immediately before both cataracts, I began to feel what it was: but I was in a manner stunned, and unable to comprehend the vastness of the scene.

"It was not until I came to Table Rock, and looked, Great Heaven, on what a fall of bright green water, that it came upon me in its full might and majesty. Then when I felt how near to my Creator I was standing, the first effect and the enduring one—instant and lasting—of the tremendous spectacle was peace, peace of mind; tranquility; calm recollection of the dead, great thoughts of eternal rest and happiness, nothing of gloom and terror. Niagara was at once stamped upon my heart, an image of beauty, to remain there changeless and indelible, until its pulses cease to beat forever.

"Oh, how the strifes and trouble of our daily life receded from my view, and lessened in the distance, during the ten memorable days we passed on the enchanted ground. What voices spoke from out the thundering waters; what faces faded from the earth, looked out upon me from its gleaming depths; what heavenly promise glistened in these Angels' tears, the drops of many hues, that showered around and twined themselves about the gorgeous arches which the changing rainbow made. I never stirred in all this time from the Canadian side whither I had gone first. I never crossed the river again, for I knew there were people on the other shore and in such a place it is natural to shun strange company.

"To wander to and fro all day and see the cataract from all points of view, to stand upon the edge of the great Horse Shoe Falls, marking the hurried water gathering strength as it approached the verge, yet seeming, too, to pause before it shot down into the gulf below; to gaze from the river's level up to the torrent as it came streaming down; to climb the neighboring heights and watch it through the trees, and see the wreathing water in the rapids hurrying on to take its fearful plunge; to linger in the shadow of the solemn rocks three miles below; watching the river as, stirred by no visible cause, it heaved and eddied and awoke the echoes, being troubled yet far down beneath the surface by its giant leap, to have Niagara before us, lighted by the sun and by the moon, red in the day's decline, and grey as evening slowly fell upon it; to look upon it every day; and wake up in the night and hear its ceaseless noise; that was enough.



The Canadian or Horseshoe Falls illuminated by electricity.

"I think in every quiet season now, still do those waters roll and leap, and roll and tumble all day long; still, are the rainbows spanning them a hundred feet below; still, when the sun is on them, do they shine and glow like molten gold; still, when the day is gloomy, do they fall like snow, or seem to crumble away like the front of the great chalk cliff, or roll down the rock like dense white smoke."

"But always does the mighty stream appear to die, as it comes down, and always from its unfathomable grave arises the tremendous ghost of spray and mist, which is never laid; which has haunted this place with the same dread solemnity since darkness brooded on the deep, and the first flood before the deluge, light came rushing on creation at the Word of God."

Many visitors have been less impressed by the Cataract itself than by the great stretch of rapids above it. The most overwhelming view is to be had from a point a little distance above Table Rock on the Canadian side. It was about this particular spot that the late Duke of Argyle wrote: "When we stand at any point near the edge of the Falls and look up the course of the stream the foaming waters of the Rapids constitute the sky line. No indication of land is visible; nothing to express the fact that we are looking at a river. The crests of the breakers, the leaping and the rushing of the waters are still seen against the clouds, as they are seen on the ocean when the ship from which we look is in the trough of the sea. It is impossible to resist the effect on the imagination. It is as if the fountains of the great deep were being broken up, and a new deluge were coming on the world. An apparently shoreless sea tumbling towards one is a very grand and a very awful sight. Forgetting, then, what one knows, and giving oneself to what one only sees, I do not know that there is anything in Nature more majestic than the view of the Rapids above the Falls of Niagara."

ELECTRICAL DEVELOPMENT

The first utilization of the motive energy latent in the Niagara for industrial purposes dates back to the French occupation. Primitive mills, operated by water power were erected on both sides of the river. In 1853 the earliest development of power on a large scale occurred on the American side, a surface canal being constructed by the Niagara Falls Hydraulic Power & Manufacturing Company. In 1881 this company produced the first supply of electric current for commercial use. The project of a power tunnel on the American side was launched in 1885, but the work was not carried out until an International Commission, headed by Sir William Thompson, afterwards Lord Kelvin, investigated hydraulic

development in all parts of the world. The initial rights of the Niagara Falls Power Co. were granted by the New York State Legislature in 1886 and ground was broken for the first installation of 15,000 horsepower on October 4th, 1890. The initial commercial delivery of energy from this plant was made on August 26th, 1895.

On May 30th, 1889, the Park Commissioners on the Canadian side received a proposal from the Niagara Hydraulic Co. for permission to develop electric power within the Park area, but after a few months the negotiations fell through. Late the same year, Col. A. D. Shaw, representing an English syndicate, made a similar proposal but was unable to carry it out. In 1892 the same Colonel Shaw formed a company known as The Canadian Niagara Power Company, and entered into an agreement with the Canadian Park Commissioners to proceed with the development of electric energy by taking water from the rapids above the Falls. This Company at first enjoyed a monopoly of operation privileges within the Park area. In July, 1899, under pressure from the Ontario Legislature, the Company relinquished its exclusive rights. At the present time this Corporation generates 100,000 horsepower; The Ontario Power Company 210,000 horsepower, and the Electrical Development Company 125,000 horsepower.

It is estimated that the maximum power capable of development along the Niagara River exceeds five million horsepower, which is equal to the aggregate horsepower used in Great Britain. Another calculation is, that the motive energy in the river and Falls is equal to sixty million tons of coal per annum.

The proposal for a public-owned development of electric energy at the Falls, originated in Toronto. The idea of a municipal electric lighting service was introduced in 1894, but it was not until the early part of 1900 that the plan of harnessing Niagara for the city's benefit began to be advanced. Other municipalities became interested in the project, and in 1903 the Provincial Legislature appointed a Commission to investigate the whole situation. The expenses of the Commission were defrayed by Toronto, London, Brantford, Stratford, Woodstock, Ingersoll and Guelph, the Commissioners being Mr. E. W. B. Snyder of St. Jacobs, Chairman; Mr. P. W. Ellis of Toronto, Vice-Chairman; Honorable Adam Beck of London, Mr. W. F. Cockshutt of Brantford, and Professor R. A. Fessenden, Canadian Electrical Engineer. This Commission reported in 1906, and in May of the same year, the Ontario Legislature created the Hydro Electric Power Commission of Ontario. On the 4th of May, 1908, an agreement was entered into for the

construction of a transmission line from Niagara Falls to the contracting municipalities. Steps were simultaneously taken for the creation of local distributing systems. The enterprise thus launched has developed into one of the most extensive and most successful public ownership undertakings in the world, and its ramifications are rapidly being broadened. The low rates given to consumers have reduced the power and lighting bills of municipalities, manufacturers and individuals in a remarkable degree. The availability of public owned power proved an important factor in Canada's successful contribution to the manufacturing side of the war. The Ontario Hydro-Electric Commission now distributes power from Niagara and several other sources. Thus far the public owned system has lent a tremendous stimulus to industrial activity in many parts of the Province, and it is considered that the presence of such an indestructible supply of "white coal" assures Ontario a highly prosperous future. The construction of public owned suburban electric railways is the latest departure under the auspices of the Ontario Hydro-Electric Commission. The Hydro-Electric System is financed by the issue of municipal bonds backed by the credit of the Provincial Government.

We come now to what is by far the most extensive constructive work undertaken by the Commission—the Chippawa-Queenston Power Canal. To explain the need for this new enterprise, it is necessary to go back ten years to a treaty entered into by the British and American Governments with a view to controlling the use of the Niagara, an international stream, for power purposes. This treaty limits to 56,000 cubic feet per second the amount of water which may be diverted for power purposes from Niagara's 220,000 cubic feet per second mean flow. Of this amount, Canada is entitled to 36,000 cubic feet per second. By an Ontario order-in-council passed in 1915, a limit was placed on the amount of water to be used by the private companies. To the Ontario Power Company was assigned 11,180 cubic feet per second, to the Electrical Development Company, 9,985 cubic feet per second; and to the Canadian-Niagara Power Company, 8,225 cubic feet per second; leaving only 6,610 cubic feet per second at the disposal of the Ontario Hydro Electric Commission. The Ontario Power Company has since been purchased by the Commission, which now has within its control a total of 17,790 cubic feet per second. Alterations in the treaty may be made from time to time to meet new conditions, or the Commission may purchase one or both of the remaining private concerns. Two of the existing Canadian plants are said to be working under net effective heads of less than 135 feet. The

Commission determined to use more of the 330 foot "head" available between the two lakes. Herein lies the reason for the Chippawa-Queenston Canal.

The canal is $12\frac{3}{4}$ miles long with the intake at Hog Island, Chippawa, about two miles above Niagara Falls and the tailrace on the Niagara River about one mile above Queenston. The power house will be located at the bottom of the gorge and it is expected that the plant will be in operation next year. It will have 6 units of 50,000 horsepower each or a total development of 300,000 horsepower, which may be increased to 475,000 horsepower. It will use 10,000 cubic feet of water per second, and is costing between \$40,000,000 and \$50,000,000. The excavation section of the canal is $8\frac{1}{2}$ miles long; the width of the rock section is 48 feet and that of the earth section 162 feet. The enterprise involves the excavation of 4,000,000 cubic yards of rock and 11,000,000 cubic yards of earth.

The present members of the Hydro Electric Power Commission of Ontario are: Sir Adam Beck, Chairman; Hon. I. B. Lucas, M.P.P. and Col. D. Carmichael. Mr. W. W. Pope is Secretary, and Mr. F. A. Gaby Chief Engineer.

*Queen Victoria, Niagara Falls,
Ontario, Park Commissioners*

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Mr. P. W. ELLIS, Chairman, Toronto.

His Honor, LIONEL H. CLARKE, Lt.-Governor
of Ontario.

Mr. GEORGE H. WILKES, Brantford.

Lt.-Col. L. CLARKE RAYMOND, K.C., Welland.

Mr. JAMES D. CHAPLIN, St. Catharines.

Mr. W. L. DORAN, Niagara Falls.

Dr. HARRY Y. GRANT, Niagara Falls.

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Mr. JOHN H. JACKSON, C.E., Superintendent.



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